**SUBSTITUTE CLAIMS**
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1. (Currently Amended) A range measuring device comprising an ultra-wideband transmitter and receiver, said device comprising:

a switched impulse generator to generate a low-level waveform adaptive ultra-wideband signal comprised of a low-level UWB energy pulse,

a wave filter that filters said ~~low-level ultra-wideband signal~~ low-level UWB energy pulse to define a center frequency thereof and to produce a filtered low-level ~~ultra-wideband signal~~ UWB energy pulse having a given bandwidth and center-frequency;

an antenna responsive to said wave filter to radiate a transmitted signal representing said filtered low-level ~~ultra-wideband signal~~ UWB energy pulse; and

a receiver ~~for receiving said radiated ultra-wideband signal~~ that receives a representation of the transmitted signal reflected from an object after the antenna completes radiating the transmitted signal.

2. (Currently Amended) A communication system utilizing an ultra-wideband transmitter, said system comprising:

a switched impulse generator ~~including one of an impulse excited oscillator and a UWB impulse generator~~ to generate a low-level ultra-wideband signal characterized by a series of UWB pulses, said switched impulse generator including one of an on-off switched oscillator, an oscillator having a time-gated dc bias that alternately

biases the oscillator on and off, and an impulse-gated mixer that mixes an oscillator output;

a filter responsive to said switched impulse generator to filter said UWB pulses by substantially passing a range of frequencies from L-Band to X-Band;

an antenna responsive to said filter to radiate a representation of said ~~ultra-wideband signal~~ UWB pulses; and

a receiver ~~for receiving said radiated ultra-wideband signal~~ that detects data from individual ones of radiated UWB pulses.

3. (Currently Amended) A method for detecting an object utilizing ultra-wideband transmitting techniques, said method comprising:

~~generating a switched impulse,~~ impulse-switching an oscillator to generate a low-level ultra-wideband signal;

wave filtering said ~~switched impulse,~~ low-level ultra-wideband signal;

after said filtering step, transmitting a signal representing said ~~switched impulse,~~ low-level ultra-wideband signal; and

after said transmitting step, receiving from said object a reflected pulse of said ultra-wideband signal thereby to detect said object.

4. (Currently Amended) A waveform adaptive ultra-wideband transmitter comprising:

a signal generator to generate a series of discrete low-level ultra-wideband signals comprised of short bursts of RF energy having a ~~selectable~~ carrier frequency defined

by cycle periodicity in respective ones of said short bursts;

a waveform adapter responsive to said low-level ultra-wideband signals and including at least one of a bandpass filter, a mixer, a pulse shaper, and an attenuator that controls one of frequency, pulse shape, bandwidth, phase, multi-level amplitude, and multi-level attenuation of said low-level ultra-wideband signals, said waveform adapter controlling said low-level ultra-wideband signals on a dynamic, real-time basis; and

an antenna responsive to said waveform adapter to radiate ultra-wideband signals.

5. (Canceled)

6. (Previously Presented) The range measuring device as recited in claim 1, wherein said receiver comprises at least one tunnel diode responsive to an echo pulse.

7. (Currently Amended) The range measuring device as recited in claim 1, further comprising an amplifier that amplifies said filtered low-level ultra-wideband signals.

8. (Previously Presented) The range measuring device of claim 7, wherein said filter comprises one of a band-pass filter and a pulse shaper.

9. (Currently Amended) The range measuring device of ~~claim 8~~, claim 1 wherein said filter defines a bandwidth of the signal radiated by the antenna to reduce out-of-band emissions radiated by said antenna.

10. (Currently Amended) The range measuring device of claim 1, wherein the receiver includes:

a variable attenuator coupled to a receiving antenna to adjust attenuation levels thereof based on a rate of error detection of said radiated ultra-wideband signal received at said receiver; and

a detector to detect an output of said variable attenuator.

11. (Currently Amended) The range measuring device of claim 10, wherein said detector comprises a tunnel diode and said variable attenuator adjusts said attenuation by alternately applying noise and received information signals to said tunnel diode.

12. (Currently Amended) The range measuring device of ~~claim 10~~ claim 11, further including a controller that digitally controls the variable attenuator according to signals received during respective noise dwells and data dwells to enable the detector to discriminate between noise and range measuring signals.

13. (Previously Presented) The range measuring device of claim 12, wherein said controller utilizes a bit error rate to discriminate between noise and range measuring signals.

14. (Currently Amended) The ~~communication system~~ waveform adaptive ultra wideband transmitter as recited in ~~claim 2~~ claim 4 wherein ~~said receiver comprises a tunnel diode to detect said radiated ultra wideband signals~~ said discrete low-level ultra-wideband signals is comprised of

short bursts of RF energy having a carrier frequency defined by cycle periodicity in respective ones of said short bursts.

15. (Previously Presented) The communication system as recited in claim 2, further comprising an amplifier interposed between said filter and antenna to amplify said ultra-wideband signal.

16. (Currently Amended) The communication system as recited in claim 15, wherein said filter comprises one of a band-pass filter and a pulse shaper that substantially confines radiated emissions of said antenna within a given passband.

17. (Currently Amended) The communication system as recited in claim 2, wherein the receiver includes:

a variable attenuator coupled to a receiving antenna to adjust attenuation levels thereof based on a rate of error detection of said radiated ultra-wideband signal received at said receiver; and

a detector to detect an output of said variable attenuator.

18. (Currently Amended) The communication system as recited in claim 17, wherein said detector comprises a tunnel diode and said variable attenuator adjusts said attenuation by alternately applying noise and received information signals to said tunnel diode.

19. (Currently Amended) The communication system as recited in ~~claim 17~~ claim 18, further including a

controller that digitally controls the variable attenuator according to signals received during respective noise dwells and data dwells to enable the detector to discriminate between said noise and received information signals.

20. (Previously Presented) The communication system as recited in claim 19, wherein said controller utilizes a bit error rate to discriminate between noise and information signals.

21. (Previously Presented) The method of claim 3, further comprising the step of providing a tunnel diode to receive the reflected pulse.

22. (Currently Amended) The method of claim 3, further comprising, ~~prior to said transmitting step~~, after generating said low-level ultra-wideband signal, amplifying said ~~switched impulse,~~ low-level ultra-wideband signal.

23. (Currently Amended) The method of claim 22, wherein said filtering ~~comprise~~ comprises one of bandpass filtering and pulse shaping of said ~~switched impulse,~~ low-level ultra-wideband signal in order to substantially confine radiated emissions of said antenna within a given passband.

24. (Previously Presented) The method of claim 23, further comprising the step of defining a bandwidth of the signal radiated upon the object.

25. (Currently Amended) The method of claim 3, further comprising, in the receiving step:

variably attenuating the ~~echo~~ reflected pulse to adjust an attenuation level thereof according detected error in the reflected pulse received at said receiver; and

detecting a signal produced by ~~an echo~~ the reflected pulse after said variably attenuating.

26. (Currently Amended) The method of claim 25, further including providing a tunnel diode to detect the reflected pulse and adjusting said variably attenuating by alternately applying noise and received information signals to said tunnel diode.

27. (Currently Amended) The method of ~~claim 25~~ claim 26, further including digitally controlling said variably attenuating of the reflected pulse according to signal received during respective noise dwells and data dwells to enable discrimination between noise and signals representing the ~~echo~~ reflected pulse.

28. (Previously Presented) The method of claim 27, including utilizing bit error rate to discriminate between noise and signals representing the reflected pulse.

29. (New) In a one-pulse, one-bit UWB transceiver system, a method of detecting transmitted information comprising:

generating a series of low-level UWB pulses of short duration,

modulating respective ones of said low-level UWB pulses according to respective bits of information,

bandpass filtering the low-level UWB pulses to reject out-of-band emissions,

radiating a filtered representation of said low-level UWB pulses, and

detecting at a receiver respective bits of information associated with distinctive ones of said UWB pulses. (McEwan detects "overlapping" bursts, Fullerton '927 integrate 200 pulses to form an information bit.)

30. (New) The method of claim 29, wherein said generating step includes generating a short burst of RF energy having a carrier frequency associated with said UWB pulses.

31. (New) The method of claim 30, wherein said short burst comprises a few cycles of RF energy that define a center frequency.

32. (New) The method of claim 31, wherein said bandpass filtering includes wave filtering said low-level UWB pulses.

33. (New) The method of claim 31, wherein said UWB pulses have pulse-to-pulse coherency.

34. (New) The method of claim 31, wherein said UWB pulses lack pulse-to-pulse coherency.

35. (New) The method of claim 31, wherein said generating step comprises impulse-driving an oscillator to produce said UWB pulses.

36. (New) The method of claim 31, wherein said generating step comprises impulse-driving a mixer which, in turn, gates an output of an oscillator to produce said UWB pulses.

37. (New) The method of claim 35, further comprising the step of impulse-driving the mixer with a low voltage with a short rise time thereby to enable switching at hundreds of megabits per second.

38. (New) The method of claim 31, wherein said generating step comprises time-gating a dc bias of an oscillator to produce said UWB pulses.

39. (New) The method of claim 31, wherein said modulating step comprises amplitude modulating said UWB pulses by on-off switching of the generating step.

40. (New) The method of claim 31, wherein said modulating step comprises multi-level amplitude modulating said UWB pulses produced by the generating step.

41. (New) The method of claim 31, wherein said modulating step comprises phase-shifting said UWB pulses.

42. (New) The method of claim 35, wherein said oscillator comprises a voltage-controlled oscillator and said modulating step comprises frequency-shifting the

voltage-controlled oscillator according to an information signal.

43. (New) The method of claim 42, further comprising the step of frequency-hopping the oscillator.

44. (New) The method of claim 31, wherein said detecting step including utilizing a tunnel diode to detect respective bits of information.

45. (New) The method of claim 44, further comprising utilizing a bit error rate to distinguish between error and information signals.

46. (New) The method of claim 31 further comprising, prior to said radiating step, amplifying the low-level UWB pulses.

47. (New) The method of claim 46, further comprising gating said amplifying in accordance with occurrence of said low-level UWB pulses in said generating step.

48. (New) The method of claim 31, wherein said short duration ranges between a sub-nanoseconds to a few nanoseconds.

49. (New) The method of claim 31, further including amplifying said low-level UWB pulse prior to said radiating step.

50. (New) A method of communicating data by transmitting and detecting an ultra wideband pulse, said method comprising:

generating a low-level UWB pulse that includes an energy burst having a few cycles of RF energy of a defined carrier frequency,

filtering the energy burst to reject out-of-band emissions,

radiating a filtered representation of said energy burst,

after said radiating step, detecting a bit of data associated with a filtered representation of said energy burst.

51. (New) The method of claim 50, wherein said filtering step includes wave filtering said energy burst to reject out-of-band emissions.

52. (New) The method of claim 50, wherein said generating step includes on-off switching of an oscillator to produce said energy burst.

53. (New) The method of claim 50, wherein said generating step includes impulse-driving a mixer which, in turn, gates an output of an oscillator to produce said energy burst.

54. (New) The method of claim 50, wherein said generating step includes time-gating a dc bias of an oscillator to produce said energy burst.

55. (New) The method of claim 50, wherein said generating step includes impulse-driving a filter to produce said energy burst.

56. (New) A method of transmitting an ultra wideband pulse, said method comprising:

generating a low-level UWB pulse that includes an energy burst having a few cycles of RF energy at a defined carrier frequency,

wave filtering the energy burst to reject out-of-band emissions, and

radiating a filtered representation of said energy burst.

57. (New) The method of claim 56, further comprising amplifying said energy burst prior to said radiating.